भारतीय मानक

Indian Standard

IS 18800 : 2023

बच्चों को दूध पिलाने के लिए स्टेनलेस स्टील की बोतल — विशिष्टि

Stainless Steel Feeding Bottle for Infants — Specification

ICS 55.100

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November 2023 **Price Group 7**

Metal Containers Sectional Committee, PGD 38

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Metal Containers Sectional Committee had been approved by the Production and General Engineering Division Council.

Feeding bottles are universally used for feeding infants. Indian Standards on 'Glass feeding bottles' and 'Plastic feeding bottles' have already been published as IS 5168 : 2018 and IS 14625 : 2015, respectively. The increase in usage of feeding bottles manufactured from stainless steel has necessitated the formulation of this standard.

Section 11(2) of *The Infant Milk Substitutes, Feeding Bottle and Infant Foods* (*Regulation of Production, Supply and Distribution*) *Act*, 1992 states that "*No person shall sell or otherwise distribute any feeding bottle unless it conforms to the Standard Mark specified by the Bureau of Indian Standards referred to in sub-section* (*1*) *for feeding bottles and such mark is affixed on its container*".

The Act has been subsequently amended as *The Infant Milk Substitute, Feeding Bottles and Infant Foods* (*Regulation of Production, Supply and Distribution*) *Amendment Act*, 2003. As per Section 2(c) of this Act, 'feeding bottle' means any bottle or receptacle used for the purpose of feeding infant milk substitutes, and includes a teat and a valve attached or capable of being attached to such bottle or receptacle.

The composition of the Committee responsible for the formulation of this standard is given in Annex F.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*) '. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

STAINLESS STEEL FEEDING BOTTLE FOR INFANTS — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and methods of sampling and tests for infant stainless steel feeding bottles and receptacles.

2 REFERENCES

The standards listed in Annex A contain provision which, through reference in the text, constitute provisions of the standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

3 TERMINOLOGY

For the purpose of this standard the following definitions shall apply:

3.1 Stainless Steel Feeding Bottle — A container which is capable of holding a fluid, fitted with a plastic or stainless steel ring and rubber silicone teat to facilitate sucking of fluid by infants and a hood for closing the container.

3.2 Locking Ring — A component used to secure a feeding teat to the container.

3.3 Protective Cover or Hood — The component as safety shield to cover a feeding teat.

3.4 Nominal Capacity — The volume of fluid normally expected to be filled in the bottles at (27 ± 2) °C.

3.5 Brimful Capacity — The volume of fluid required to fill the bottle completely to brim level at (27 ± 2) °C.

3.6 Re-Usable — A component intended to be used again after first use.

3.7 Single Use Feeding Teat — A feeding teat sold for single use.

4 MATERIAL

4.1 Body of Feeding Bottle

The following grades of steel shall be used for the manufacturing of feeding bottles:

a) Grades N2 and N3 as per IS 15997;
b) Grade 304 as per IS 5522; or
c) Grade 316 L as per IS 6911.

4.2 Locking Ring

The locking ring shall be made of either food grade polypropylene and its co-polymer as per IS 10910, or steel of grade as mentioned in **4.1**.

4.3 Protective Cover or Hood

The protective cover shall be made of either polypropylene conforming to IS 10910 or steel material of grade as mentioned in **4.1**.

4.4 Feeding Teat

The feeding teat shall conform to IS 3565.

5 REQUIREMENT

5.1 Physical Requirements

5.1.1 *Description*

The feeding bottle shall be of suitable design, shape and required dimensions which is illustrated in typical example of stainless steel feeding bottle as shown in Fig. 1. In addition, any other design, shape and size may also be manufactured as agreed to between the purchaser and the supplier. However, the shape and design shall be such that it is easily cleanable.

5.1.2 *Manufacture, Workmanship, Finish and Appearance*

5.1.2.1 The bottles shall be manufactured by a suitable process adhering to good manufacturing practice (GMP).

5.1.2.2 The body of the bottle shall be smooth, both internally and externally, free from any visual defects like strains, streaks, flaws etc. All components of stainless steel feeding bottle when assembled for use shall be free from points and edges and any harmful extrusions which are likely to cause injury. All parts which are designed to be detached (for example, for cleaning) shall not fit entirely within a small parts cylinder in any orientation and without compression.

5.1.3 *Wall Thickness*

The minimum wall thickness shall be declared by the manufacturer. However, wall thickness when measured in accordance with **10.1** of IS 5522 shall not be less than the declared value.

5.1.4 *Capacity*

The bottles shall be manufactured in nominal capacity of 120 ml and 240 ml or any other capacity as agreed to between the purchaser and the supplier. The brimful capacity shall exceed the nominal capacity by a minimum of 15 percent.

5.2 Mechanical Requirements

The locking ring and proactive cover or hood shall be tested in accordance with Method I of IS 8747 and shall show no evidence of stress cracking or leakage after being kept in oven for 48 h.

NOTE — This test is only applicable in case locking ring or protective cover is made of polypropylene.

5.3 Performance Requirements

5.3.1 *Leakage Test*

The bottles filled to brim level with water at ambient temperature and closed tight with closures shall be kept for 24 h in a horizontal position. During and at the end of the period, the bottles shall not show any leakage. The bottles shall be then held vertically upside down for 10 min and the bottle shall not show any leakages. The bottles may be kept on a blotting paper in upside down position and any leakages observed shall be noted.

5.3.2 *Drop Test*

The bottles filled to brim level with water at ambient conditions and closed tight with closures shall not show any sign of rupture or leakage when tested in accordance with the method described in Annex B. The dropping height of the bottles shall be 1.2 m.

5.3.3 *Compressive Deformation Resistance*

The bottles shall not get deformed by more than 10 percent in diameter in compressive direction at the compressive load of 2.5 kgf (1 kgf = 9.80 665 N) when tested in accordance with the method described in Annex C.

5.3.4 *Permanency of Pigments of Printed Container*

The printed bottles when tested in accordance with the method prescribed in Annex D shall not show any significant removal of print from the bottle surface and the print shall be legible to the naked eye after the test.

6 PACKING AND MARKING

6.1 Packing

The bottles shall be packed as agreed to between the purchaser and the supplier.

6.2 Marking

6.2.1 The package containing the bottle shall be permanently marked with the following:

a) Indication of source of manufacture and trade-mark of the company responsible for placing the product in the market, if any;
b) Nominal capacity;
c) Batch No. and code No.;
d) Month and year of manufacture; and
e) Instruction for use and hygienic care of the product shall be printed in English/Hindi/ regional language and may be included in a separate leaflet placed in or/on the product as given in **6.2.2**.

6.2.2 *Instructions for Use*

6.2.2.1 The following information shall be provided:

a) Information for the safe use of the product; and
b) Information on unsuitable common methods of heating which might damage the product.

6.2.2.2 For re-usable products, the following additional instructions shall be provided:

a) At least one method of cleaning;
b) Before first use, clean the product; and
c) Information on unsuitable common methods of cleaning, storage and use which might damage the product.

6.2.2.3 For products with feeding accessories the following warnings shall be provided in the form as given:

WARNING

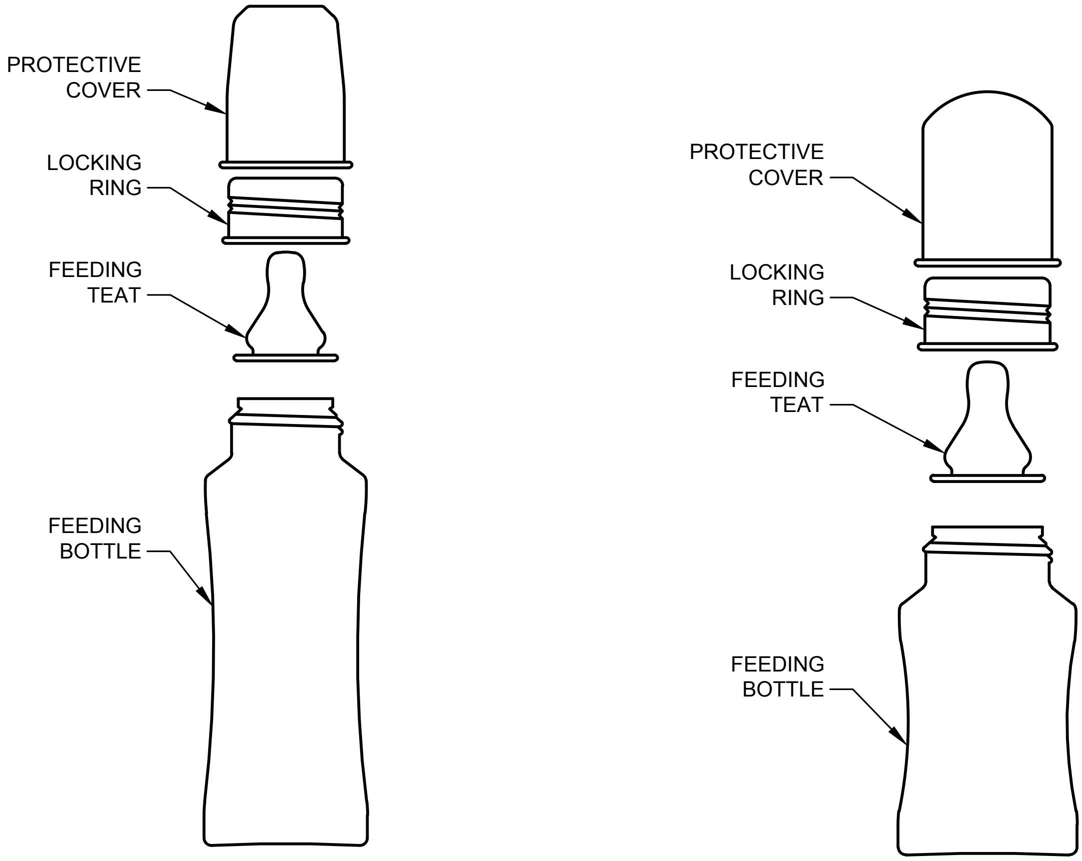
a) Always use this product with adult supervision.
b) Always check food temperature before feeding.
c) Keep all components not in use, out of the reach of children.

6.3 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may also be marked with the Standard Mark.

7 SAMPLING

The sampling plan of the bottles and the criteria for conformity shall be determined as prescribed in Annex E.



(a) (b)

FIG. 1 TYPICAL DESIGN OF STAINLESS STEEL FEEDING BOTTLE, (a) 240 ml (b) 120 ml

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 249 : 2022	Sodium bichromate, technical — Specification (*fourth revision*)
IS 266 : 1993	Sulphuric acid — Specification (*third revision*)
IS 3565 : 2018	Teats for feeding bottles — Specification (*first revision*)
IS 4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)
IS 5522 : 2014	Stainless steel sheets and strips for utensils — Specification (*third revision*)
IS 6911 : 2017	Stainless steel plate, sheets and strip — Specification (*second revision*)
IS 8747 : 1977	Methods of test for environmental stress-crack resistance of blow-moulded polyethylene containers
IS 10910 : 1984	Specification for polypropylene and its copolymers for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
IS 15997 : 2012	Low nickel austenitic stainless steel sheet and strip for utensils and kitchen appliances — Specification

ANNEX B

(*Clause* 5.3.2)

DROP TEST

B-1 SAMPLE SIZE

The sample size shall be 10 bottles, taken at random from a batch, divided into two sets of 5 each and designated as Set 1 and Set 2.

B-2 PROCEDURE

B-2.1 Fill each bottle with water at ambient conditions and close tight with closures.

B-2.2 Drop the bottles under free fall conditions in Set 1 squarely on their base on to a rigid flat horizontal surface of steel of smooth concrete as the dropping surface.

B-2.3 Drop the bottle under free fall condition in Set 2 on their side (the body of bottle being parallel to the impacting floor) onto the dropping surface.

B-2.4 Examine each bottle for signs of rupture or leakage.

ANNEX C

(*Clause* 5.3.3)

COMPRESSIVE DEFORMATION TEST

C-1 PROCEDURE

Place the sample specimen of the steel feeding bottle in horizontal condition on the platform given in the compression testing equipment as shown in Fig. 2. Apply the compressive load in the middle part of the body or to the part having the maximum diameter of a stainless feeding bottle by the use of compressive jig. Gradually increase the top load and apply on the top horizontal surface of the bottle by maintaining a speed of the machine at the rate of 10 mm/min for a period of 1 min, up to the maximum load of 2.5 kgf, to assess the withstanding capacity of the steel bottle without any deformation.

C-2 ACCEPTANCE CRITERIA

There shall not be any dent or deformation on the body of the steel bottle after applying the load of 2.5 kgf.

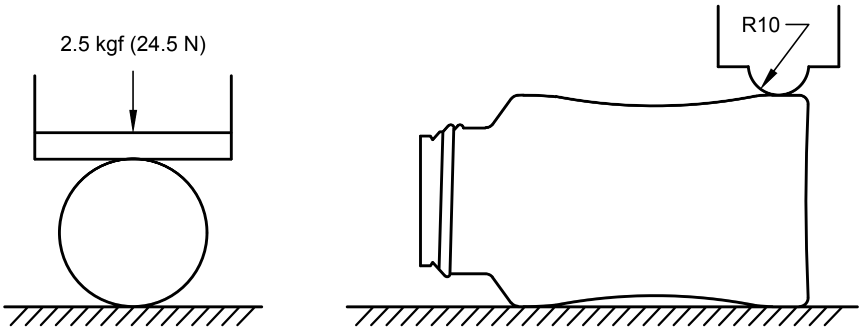


FIG. 2 COMPRESSION JIG

ANNEX D

(*Clause* 5.3.4)

TEST FOR PERMANENCY OF PIGMENTS ON PRINTED CONTAINER

D-1 GENERAL

This test is meant only for feeding bottles with printing on the outer surface.

D-2 REAGENTS

D-2.1 Sodium Bichromate — *see* IS 249

D-2.2 Concentrated Sulphuric Acid — relative density 1.834 approximately (*see* IS 266)

D-3 PROCEDURE

D-3.1 Weigh about 20 g of sodium bichromate, dissolve in 1 500 ml of concentrated sulphuric acid and dilute to 2 500 ml with water. Immerse the bottles in the solution at room temperature for 15 min. Rinse the samples with water and dry.

D-3.2 The bottles shall be taken as having satisfied the requirements of the test if the printed impressions do not become illegible.

ANNEX E

(*Clause* 7)

SAMPLING OF STAINLESS STEEL FEEDING BOTTLE

E-1 SCALE OF SAMPLING

E-1.1 Lot

In any consignment, all the bottles of the same material, size and drawn from a single batch of manufacture shall be grouped together to constitute a lot.

E-1.2 Scale of Sampling

For ascertaining the conformity of the lot to the requirements of this standard, tests shall be carried out for each lot separately. The number of bottles to be sampled from a lot shall be in accordance to Table 1.

E-1.3 The bottles shall be selected at random from the lot. To ensure the randomness of selection, methods given in IS 4905 may be followed.

E-2 CRITERIA FOR CONFORMITY

E-2.1 Manufacture, Workmanship, Finish and Appearance

The samples selected as given in col (3) of Table 1, shall be examined for manufacture, workmanship, finish and appearance. Any bottle failing in one or more of the requirements shall be termed as defective. The lot shall be accepted under this head, if the number of defective bottles in sample does not exceed the acceptance number given in col (4) of Table 1.

E-2.2 Capacity — (*see* 5.1.4)

Five bottles for lot size up to 5 000 and 10 bottles for lot size above 5 000 shall be selected at random from the samples already drawn according to **E-1.3**. There shall be no failure, if the lot is to be accepted under this clause.

E-2.3 Permanency of Pigment Test for Printed Containers, Leakage Test, and Compressive Deformation Test

The number of samples to be drawn shall be in according to col (5) of Table 1. Each of the sample shall be subjected to permanency of pigments (*see* **5.3.4**), leakage test (*see* **5.3.1**), compressive deformation test (*see* **5.3.3**). The number of failures shall not exceed the acceptance number given in col (6) of Table 1 for all tests, except leakage test. For leakage test, the acceptance number is zero, that is, no failure shall occur for lot acceptance.

E-2.4 Drop Test

The sample as given in test method (*see* **5.3.2**) shall be drawn from the lot and these shall be subjected to Drop test. There shall be no rupture or leakage in any bottle after the test for acceptance. In case, even one bottle has any sign of rupture or leakage, the lot shall be considered as non-conforming to the requirements of this specification.

Table 1 Scale of Sampling and Acceptance Number

(*Clauses* E-1.2, E-2.1 *and* E-2.3)

Sl No.	**Lot Size**	**Manufacture, Workmanship, Finish and Appearance**		**Permanency of Pigment Test for Printed Containers, Leakage Test, and Compressive Deformation Test**	
		Sample Size	Acceptance Number	Sample Size	Acceptance Number
(1)	(2)	(3)	(4)	(5)	(6)
i)	Up to 500	13	1	5	0
ii)	501 to 1 000	20	2	8	0
iii)	1 001 to 3 000	32	3	13	0
iv)	3 001 to 5 000	50	5	20	1
v)	5 001 and above	80	7	32	1

ANNEX F

(*Foreword*)

COMMITTEE COMPOSITION

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Organization	*Representative(s)*
In Personal Capacity (*Flat No. P04, IVY Tower, Nahar Amrit Shakti, Chandivali, Powai, Mumbai - 400072*)	DR N. C. SAHA (***Chairperson***)
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Asian Paints Ltd, Mumbai	SHRI NAVNINDER SINGH MS SHWETA TIWARI (*Alternate*)
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Balmer Lawrie and Company Ltd, Mumbai	SHRI R. S. PATEL SHRI AMIT MITRA (*Alternate*)
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Panel for Stainless Steel Feeding Bottle, PGD 38/Panel 5

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Dev Enterprises, Thane	SHRI DILIP JAIN
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